

## ABSTRACT

A method to suppress the short channel effect of a semiconductor device is described. The method provides a substrate having a gate structure formed thereon. A source/drain extension region and a source/drain region formed in the substrate beside the gate structure. A pocket ion implantation process is conducted to form a pocket doped region underneath the source/drain extension region. A rapid thermal process is conducted subsequent to the formation of the source/drain extension region, the source/drain region and the pocket doped region.